

## REMARKS:

The Examiner has allowed all the claims and has issued an Ex Parte Quayle office action requiring corrections to specification pages 1, 12-14, 16 and 17 since those pages refer to patent claims 1-8, which have been cancelled. In response thereto, the Examiner's attention is referred to the preliminary amendment received by the US PTO on January 9<sup>th</sup> 2006, a copy of which is enclosed for the convenience of the Examiner. The preliminary amendment directs amendment to the specification to eliminate precisely the references to the claim numbers to which the Examiner has objected. If this preliminary amendment has in fact not been entered, the applicant respectfully requests the Examiner enter the changes indicated in the preliminary amendment by Examiner's amendment to pass this case on to issuance.

Respectfully submitted,

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June 8, 2009

Date

Enclosures: Copy of preliminary amendment as filed on January 9<sup>th</sup>  
2006.

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## PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|                  |   |                          |
|------------------|---|--------------------------|
| Applicant:       | BUMILLER, Gerd  | ) Examiner:              |
| PCT Appl. No.:   | PCT/EP2004/007646   | ) unknown                |
| PCT Filing Date: | July 11, 2004   | ) Art Unit:              |
| For:             | INDUCTIVE COUPLING CIRCUIT AND<br>TELECOMMUNICATION METHOD BY<br>SHEATHED CABLES OF AN ELECTRICAL<br>CURRENT DISTRIBUTION NETWORK | ) unknown<br>)<br>)<br>) |

Atty. Docket No.: U202US(PCT)

MAIL STOP PCT  
Commissioner for Patents  
Alexandria, VA 22313-1450  
U.S.A.

## PRELIMINARY AMENDMENT

Please enter this amendment prior to calculation of the filing fees. This amendment is based on the translation of the application as filed on July 11, 2004.

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**SPECIFICATION AMENDMENTS:**

On page one, between the title of the invention and the first paragraph, replace "Description" with --

This application is the national stage of PCT/EP2004/007646 filed on July 11, 2004 and claims Paris Convention priority of DE 103 31 744.9 filed July 11, 2003

**BACKGROUND OF THE INVENTION --.**

Please amend the first paragraph on page 1 as follows--

The invention primarily concerns an inductive coupling circuit (~~patent claims 1 and 2~~). Furthermore, the invention relates to a telecommunication method in sheathed cables of an electric current distribution network (~~patent claims 7 and 8~~).--.

On page 11 insert as a title following line 2 --

**SUMMARY OF THE INVENTION --.**

Please amend the first full paragraph on page 11 as follows --

This object is achieved in accordance with ~~patent claim 1~~ the invention by an inductive coupling circuit for information transmission in electric

**DESCRIPTION OF THE PREFERRED EMBODIMENT --.**

On page 22, line 1, replace as a title "Claims" with --

**I CLAIM:** --.

**CLAIM AMENDENTS:****Claims 1-8 (cancelled)**

**9. (new) An inductive coupling circuit for information signal transmission in electric energy distribution grids and disposed within a transmission path, the transmission path having a shielded power cable with a power cable conductor, the circuit comprising:**

**an inductive coupling device having a ring that encloses the shielded power cable, and a coil inductively coupled to said ring and connected to a transceiver unit, wherein a current of a superposed information signal in the power cable conductor flows through a plane defined by said inductive coupling device; and**

**an earth wire disposed upstream of said plane defined by said inductive coupling, said earth wire connected to the power cable shield and to earth or to a potential compensation, wherein no net current flows in the shield, since there is no conductive connection from one side of said plane to an other side of said plane, other than through said plane itself, and wherein, during transmission, current of an information signal is directly induced into the conductor and, during reception, only current within the conductor is evaluated.**

**10. (new) An inductive coupling circuit for information transmission in electric energy distribution grids, the grids having a shielded**

energy distribution grids which is located within the transmission route and which comprises:--.

Please amend the last paragraph on page 11 extending to page 12 as follows --

Furthermore, this object is achieved in accordance with ~~patent claim 2~~ the invention by an inductive coupling circuit for information transmission in electric energy distribution grids which is located within the transmission path and which comprises: --

Please amend the last paragraph on page 12 extending to page 13 as follows --

This object is also achieved by a method for information transmission in electric energy distribution grids with shielded power cables and with an inductive coupling circuit linked to it, ~~in accordance with patent claim 7,~~ wherein the inductive de-/coupling of the information signal through the plane defined by an inductive coupling device of the coupling circuit is performed in such a manner that no current results in the shield and there is no conductive connection from one side of the plane defined for the inductive coupling to the other side, other than the connection through the plane itself, wherein during transmission, the current of the information signal is directly induced into the conductor and, during reception, only the current within the conductor is evaluated. --.

Please amend the first full paragraph on page 13 as follows --

Finally, this purpose is achieved, based on a method for information transmission in electric energy distribution grids with shielded power cables and with an inductive coupling circuit linked to it, in accordance with patent claim 8, by the fact that the inductive de-/coupling of the information signal is performed in such a manner that the current of the superposed information signal in the conductor of the power cable, the return current and/or induced interference signals on the shield as well as the identical return current and/or induced interference signals flow, in opposite directions, through the plane defined by an inductive coupling unit of the coupling circuit, wherein the magnetic field of the two last currents is compensated for and wherein the inductive coupling unit induces the current directly into the conductor when transmitting and only evaluates the current in the conductor when receiving. --.

Please amend the last paragraph on page 13 as follows --

For the inductive coupling circuits according to patent claim 1 or 2 of the invention and the method according to patent claim 7 or 8 of the invention, an installation of the inductive coupling module at the cable is performed via shield and conductor. The shield of an energy line is connected at the end point with ground or a compensational potential available in the transformer station by means of a conductive material, e.g. a metallic fiber ribbon. Thus, the current in the shield flows off to earth over this conductive material, called earth wire (arrester). Hence,

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the current in the earth wire and in the shield are almost identical (identical at the end of the earth wire/arrester). --.

Please amend the first paragraph on page 14 as follows --

~~For the In an embodiment according to patent claim 2 and patent claim 8 respectively of the invention, the earth wire/arrester is lead back through the plane that is defined by the inductive coupling. The ring-shaped magnetic field now induces a current both into the shield and the earth wire. As this current flows through the plane of the ring-shaped magnetic field in the same direction, the current flow is in the opposite direction with respect to the conductor. The opposite currents compensate each other so that nearly no current flow results within the shield. Since now there is no current in the shield, the current is induced into the conductor. --.~~

Please amend the second paragraph on page 14 as follows --

This also applies, if the earth wire has a conductive connection to the shield after crossing the plane for the inductive coupling. In general, it can be said that no current flow results in the shield if there is no other conductive connection from one side of the plane defined for the inductive coupling to the other side other than the connection through the plane itself. Furthermore, this also applies for the embodiment according to patent claim 1 and patent claim 7 respectively, where ~~embodiments of the invention with which the earth wire is located ahead of the plane for the inductive coupling and is lead away from the shield. --.~~

Please amend the last paragraph on page 14 extending to page 15 as follows --

The inductive coupling circuits according to ~~patent claims 1 or 2 and patent claims 7 or 8~~, respectively, of the invention have the advantage that by coupling the current into the conductor, the transmission of data is no longer limited to the transmission route between neighboring transformer stations. Since, in most cases, a transformer represents a load of relatively high impedance, most of the current remains in the line that is carried on. Thus, a high number of transformer stations can be bypassed without installing a transceiver unit (for repeater purposes) in these stations. --.

Please amend the last paragraph of page 16 as follows --

In a further development of the invention ~~in accordance with claim 3~~, the inductive coupling device is located in a transformer station and the ring is embodied as a ring-toroidal core or as a plastic ring with wrapped coil. --.

Please amend the second paragraph on page 17 as follows --

In networks where both overhead cable and underground cables are used the transformer stations are often also connected via underground cable. As the current is induced directly into the conductor, this system can also be used for networks. For short distances between the

overhead cable and the transformer station mostly three underground cables, each having a conductor and a shield, are used. Herewith, all inductive coupling units are linked to the same phase in a preferred embodiment of the invention in accordance with claim 4. In a further development of the invention according to claim 5, the inductive coupling unit is linked to all phases. --.

Please amend the third paragraph on page 17 as follows --

Embodiments of the invention The embodiment according to claim 4, and the further development of the invention in accordance with claim 5 respectively, are advantageous which allow in that even a mixed installation over one and all three phases is possible with only low losses. --.

Please amend the last paragraph on page 17 as follows --

In a further development of the invention in accordance with claim 6, the inductive coupling device is linked to the incoming line of the transformer.

On page 18 insert as a title prior to the brief description of the drawings

**BRIEF DESCRIPTION OF THE DRAWING --**

On page 18 insert as a title following the brief description of the drawings --

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**power cable having a power cable conductor, the circuit being located within a transmission path, the circuit comprising:**

**an inductive coupling device having a ring which encloses the shielded power cable and a coil inductively coupled to said ring and connected to a transceiver unit; and  
an earth wire connected to the power cable shield and to earth or to a potential compensation, the earth wire being lead back through the ring core, wherein current of a superposed information signal in the power cable conductor, a return current and/or induced interference signals on the shield as well as an identical return current and/or induced interference signals flow through a plane defined by said inductive coupling device in opposite directions, wherein magnetic fields of interfering currents are compensated, said inductive coupling device inducing current directly into the conductor when transmitting and only evaluating current in the conductor when receiving.**

- 11. (new) The inductive coupling circuit of claim 9, wherein said inductive coupling device is located in a transformer station and said ring is a ring core or a plastic ring with a wrapped coil.**
- 12. (new) The inductive coupling circuit of claim 10, wherein said inductive coupling device is located in a transformer station and said ring is a ring core or a plastic ring with a wrapped coil.**

13. (new) The inductive coupling circuit of claim 9, wherein all inductive coupling devices are linked to a same phase in a transmission path having several underground cables.
14. (new) The inductive coupling circuit of claim 10, wherein all inductive coupling devices are linked to a same phase in a transmission path having several underground cables.
15. (new) The inductive coupling circuit of claim 9, wherein said inductive coupling device is linked to all phases.
16. (new) The inductive coupling circuit of claim 10, wherein said inductive coupling device is linked to all phases.
17. (new) The inductive coupling circuit of claim 9, wherein said inductive coupling device is linked to an incoming line of an transformer.
18. (new) The inductive coupling circuit of claim 10, wherein said inductive coupling device is linked to an incoming line of an transformer.
19. (new) a method for information transmission in electric energy distribution grids having shielded power cables and with an inductive coupling circuit linked thereto, the method comprising the step of:

inductively de-/coupling an information signal through a plane defined by an inductive coupling device of the coupling circuit in such a manner that no net current flows in the power cable shield, wherein no conductive connection is made from one side of the plane defined for the inductive coupling to an other side, other than a connection through the plane itself, wherein, during transmission, information signal current is directly induced into the power cable conductor and, during reception, only a current within the conductor is evaluated.

20. (new) A method for information transmission in electric energy distribution grids having shielded power cables and with an inductive coupling circuit linked thereto, the method comprising the step of:

inductively de-/coupling an information signal in such a manner that a current of a superposed information signal in a conductor of the power cable, a return current and/or induced interference signals on the power cable shield as well as an identical return current and/or induced interference signals flow in opposite directions through a plane defined by an inductive coupling device of the coupling circuit, wherein magnetic fields of interfering currents are compensated, and the inductive coupling device induces current directly into the conductor when

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**transmitting and only evaluates current in the conductor  
when receiving.**

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**Remarks:**

The amendments have been taken to adapt this PCT application to United States practice. No new matter has been added.

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January 05, 2006

Date

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